APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,889	03/01/2004	Mary Morabito O'Neill	03W124	2628

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EXAMINER
WYATT, KEVIN S

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/790,889	O'NEILL ET AL.
	Examiner	Art Unit
	Kevin Wyatt	2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>26 January 2006</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,11-15 and 17-21* is/are rejected.

7)☒ Claim(s) *6-10 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims 1-4, 11-15, and 17-21 are rejected under 35 U.S.C. 102(b) as being

anticipated by Hou (U.S. Patent No. 6,596,979 B2).

Regarding claim 1, Hou shows in Figs. 2-3 and 10, an imaging sensor system

comprising an optics system that images a point feature (960, 968 and 970, i.e.

scanning dots) of a scene at an image plane as a blur-circle image having a blur

diameter; and a detector array (950, i.e. image sensor) at the image plane, wherein the

detector array is a one-dimensional detector array comprising a plurality of detector

subelements (962-967, i.e. photodetectors) each having a width of from about 1/2 to

about 5 blur diameters (1 blur diameter is equivalent to from approximately the area of a

single detector to approximately 1/2 the area of 3 adjacent detectors according to col.

10, lines 12-18), and a length of n blur diameters (n is approximately equal to the width

of the detector if detector is approximately square), wherein each detector subelement

overlaps each of two adjacent detector subelements along their lengths, wherein an

overlap of each of the two adjacent detector subelements is m blur diameters (shifted

alternatively by a distance (D) and (D) is in general, preferably 1/2 size of a

photodetector, col. 9, lines 59-60) and a center-to-center spacing of each of the two

adjacent detector subelements is n_O blur diameters (or 2D), and wherein n is equal to about 3m and m is equal to about $n_O/2$ (col. 9, lines 59-60 implies that a tolerance of plus or minus D may fall within these measurements).

Regarding claim 2, Hou discloses that the detector subelements each have a width of about 1 blur diameter (1 blur diameter corresponds to the area of a single detector to approximately 1/2 the area of 3 adjacent detectors according to col. 10, lines 12-18).

Regarding claim 3, Hou discloses that n lies in a range of from about (3m - 2) to about (3m + 2), and m lies in a range of from about ($n_O/2$ - 1) to from ($n_O/2$ + 1)(according to claim 1, if D corresponds to m, and 3D corresponds to n, then both m and n fall within the recited ranges).

Regarding claim 4, Hou discloses that n lies in a range of from (3m - 2) to (3m + 2), and m lies in a range of from ($n_O/2$ - 1) to ($n_O/2$ + 1)(according to claim 1, if D corresponds to m, and 3D corresponds to n, then both m and n fall within the recited ranges).

Regarding claim 11, Hou discloses a scanning mechanism that scans the one-dimensional detector array in a scanning direction perpendicular to the length of the detector subelements (col. 5, lines 39-42).

Regarding claim 12, Hou discloses a scanning mechanism that includes a moving platform upon which the one-dimensional detector array is mounted (col. 5, lines 39-42).

Regarding claim 13, Hou shows in Figs. 2A and 10, an imaging sensor system

comprising an optics system (208, i.e., rod lens array) that images a point feature of a

scene at an image plane as a blur-circle image having a blur diameter (960, 968, 970,

i.e., scanning dots); and a detector array (250, photodetector array) at the image plane,

wherein the detector array is a one dimensional detector array or a two-dimensional

detector array comprising a plurality of detector subelements, and wherein the detector

subelements are sized responsive to the blur diameter.

Regarding claim 14, Hou shows in Fig. 10, the detector subelements are square

in plan view (col. 6, lines 39-40).

Regarding claim 15, Hou shows in Fig. 10, the detector subelements are

rectangular in plan view (col. 6, lines 39-40).

Regarding claim 17, Hou shows in Figs. 2A-2B, 3 and 10, a method for locating a

position of a feature in a scene, comprising the steps of forming an image of the feature

using a segmented array having a plurality of array subelements, wherein each of the

array subelements has an output signal (col. 5, lines 27-35); and cooperatively

analyzing the output signals from at least two spatially adjacent array subelements to

establish a data set reflective of an extent to which output signals responsive to the

image of the feature are produced from exactly one or from more than one of the

adjacent array subelements (col. 5, lines 48-57), and to reach a conclusion from the

data set as to a location of the image of the feature on the segmented array (col. 5, lines

57-60).

Regarding claim 18, Hou shows in Fig. 10 a method wherein the step of

providing a sensor includes the step of providing a one-dimensional segmented array

having spatially overlapping array subelements.

Regarding claim 19, Hou shows in Fig. 10 a method wherein the step of

providing a sensor includes the step of providing a two-dimensional segmented array

formed of a pattern of intersecting array subelements.

Regarding claim 20, Hou shows in Figs. 9A-9B, a method wherein the step of

providing a sensor includes the step of providing a two-dimensional segmented array

formed of a pattern of square array subelements, wherein four of the square array

subelements meet at an intersection point (col. 9, lines 21-24), and wherein the step of

forming an image includes the step of forming the image having a diameter of one blur

diameter.

Regarding claim 21, Hou shows in Fig. 10, that each detector subelement

overlaps each of two adjacent detector subelements along their lengths by an amount

that is responsive to the blur diameter.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1-5, are rejected under 35 U.S.C. 103(a) as being unpatentable over

Carnall, Jr. (U.S. Patent No. 5,065,245) in view of Hou (U.S. Patent No. 6,596,979 B2).

Regarding claim 1, Carnall, Jr. shows in Fig. 1 an imaging sensor

system (10, i.e., modular image sensor array) a detector array at the image plane, wherein the detector array is a one-dimensional detector array comprising a plurality of detector subelements each having a width of from about 1/2 to about 5 blur diameters, and a length of n blur diameters, wherein each detector subelement overlaps each of two adjacent detector subelements along their lengths, wherein an overlap of each of the two adjacent detector subelements is m blur diameters and a center-to-center spacing of each of the two adjacent detector subelements is n_0 blur diameters, and wherein n is equal to about 3m and m is equal to about $n_0/2$. Carnall, Jr. does not disclose an optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter. Hou shows in Fig. 2B, an optics system (208, optical lens 274) that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter (col. 5, lines 27-33). It would have been obvious to one skilled in the art to provide the optics system of Hou to the device of Carnall, Jr. for the purpose of providing a reliable means of focusing and aligning image onto the photodetector array.

Regarding claims 2-5, Carnall, Jr. discloses the claimed invention as stated above. In addition, Carnall, Jr. shows in Fig. 1 a) subelements each have a width of about 1 blur diameter; b) n lies in a range of from about (3m-2) to about (3m+2), and m lies in a range of from about $(n_0/2-1)$ to about $(n_0/2+1)$; c) n lies in a range from (3m-2) to (3m+2), and m lies in a range of from $(n_0/2-1)$ to $(n_0/2+1)$; and d) n is equal to 3m and m is equal to $n_0/2$. Carnall, Jr. does not disclose an optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter.

Hou shows in Fig. 2B, a) an optics system (208, optical lens 274) that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter (col. 5, lines 27-33). It would have been obvious to one skilled in the art to provide the optics system of Hou to the device of Carnall, Jr. for the purpose of providing a reliable means of focusing and aligning image onto the photodetector array.

Allowable Subject Matter

5.   Claims 6-10 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6.   The following is a statement of reasons for the indication of allowable subject matter:

Claim 6, is allowable because the prior art fails to disclose or make obvious, either singly or in combination, an imaging sensor system, comprising, in addition to the other recited features of the claim, detector subelements having a length of at least 20 times the detector width, and wherein n is substantially equal to 3m and m is substantially equal to $n_O/2$.

Claim 7 is allowable because the prior art fails to disclose or make obvious, either singly or in combination, an imaging sensor system, comprising, in addition to the other recited features of the claim, detector subelements wherein n is substantially equal to (3m-2) and m is substantially equal to $(n_O/2-1)$.

Claim 8 is allowable because the prior art fails to disclose or make obvious,

either singly or in combination, an imaging sensor system, comprising, in addition to the

other recited features of the claim, detector subelements having a length of less than 20

times the detector width, and wherein n is substantially equal to $(3m-2)$ and m is

substantially equal to $(n_0/2-1)$.

Claim 9 is allowable because the prior art fails to disclose or make obvious,

either singly or in combination, an imaging sensor system, comprising, in addition to the

other recited features of the claim, detector subelements wherein n is substantially

equal to $(3m+2)$ and m is substantially equal to $(n_0/2+1)$.

Claim 10 is allowable because the prior art fails to disclose or make obvious,

either singly or in combination, an imaging sensor system, comprising, in addition to the

other recited features of the claim, detector subelements having a length of less than 20

times the detector width, and wherein n is substantially equal to $(3m+2)$ and m is

substantially equal to $(n_0/2+1)$.

Claim 16 is allowable because the prior art fails to disclose or make

obvious, either singly or in combination, an imaging sensor system, comprising, in

addition to the other recited features of the claim, detector subelements having a

lengthwise overlap of 1 blur diameter relative to a laterally adjacent detector

subelement.

Response to Arguments

7.   Applicant's arguments filed on 1/26/2006 have been fully considered but they are

not persuasive.

In response to applicant's argument that there is no disclosure in Hou of a

blurred image of a point feature of a scene, such as discussed in para [0034], recited in

claims 1 and 13, the examiner disagrees. The blur circle recited in claims 1 and 13, and

in paragraph 0034 of the specification, is disclosed by Hou due to the fact that the

degree of blur of a point feature (scanning dot) depends on the degree of aberration and

diffraction of the lenses (rod lens array (208) in Fig. 1 and optical lens (274) in Fig. 2B).

In response to applicant's argument that the detector disclosed in Figure 10 and

discussed in col. 9, lines 52 et seq. is not a one-dimensional array, and that no such

disclosure is made in col. 10, lines 12-18 of Hou as recited in claim1, the examiner

disagrees. The detector shown in Fig. 10 is a staggered detector that functions as a

one-dimensional array by sequentially scanning the point feature (scanning dot) as it

moves in a linear direction.

In response to applicant's argument that Hou presents no concept of the size of

photodetectors in relation to a blurred point image, the examiner disagrees. The

concept of size is disclosed starting from col. 9, lines 59-61.

In response to applicant's argument regarding claims 2-4 that Hou does not

mention the recited relationships or blur diameters, the examiner disagrees. The

relationships or blur diameters can be derived from the size relationships disclosed in

col. 9, lines 59-61.

In response to applicant's argument regarding claim13, Hou does not disclose a

blur diameter and disclose or suggest that the photodetectors are sized in relative to

blur diameter, the examiner disagrees. The limitations of Hou which address claim 13

relative to blur diameter are disclosed in col. 9, lines 59-61.

In response to applicant's argument that Hou has no disclosure that the scanning dots meet the "blur-circle image", and the "blur-circle diameter" the examiner disagrees. The limitations relating to the "blur-circle image", and the "blur-circle diameter" are fully disclosed in col.10, lines 3-18 as a scanning dot featuring a point image.

In response to applicant's argument that the logic illustrated in Figs. 2A-B and 3 has no capability for determining whether an output signal responsive to the image is produced from exactly one or from more than one adjacent array subelement, the examiner disagrees. According to col. 5, lines 4-9, the output signal responsive to the image is read by the processing electronics (252).

In response to applicant's argument that there is no mention of any sampling device or logic for determining whether one more than one of the adjacent photodetectors is producing an output signal, the examiner disagrees. The full disclosure of this limitation may be cited in col. 10, lines 19-31.

In response to applicant's argument that there is no disclosure of the limitations in claims 17 and 20, the examiner disagrees. The disclosures in Hou addresses all of the limitations for claim 17, in col. 5, lines 27-35, col. 5, lines 48-57, and col. 5, lines 57-60 in addition to Figs. 2A-2B, 3 and 10. In addition, Hou discloses the limitations in claim 20, in col. 9, lines 21-24.

Conclusion

1.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
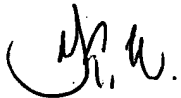
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Wyatt whose telephone number is (571)-272-5974. The examiner can normally be reached on Monday-Friday.
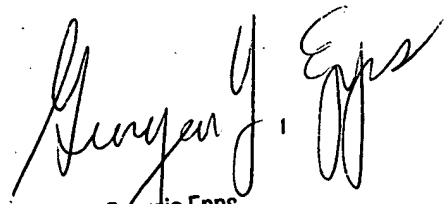
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571)-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

K.W.

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